

### **AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions and listings of claims in the application:

1-53 (cancelled)

54. (Previously Presented) A method of producing collagen monomers comprising:

- (a) providing microorganisms;
- (b) providing collagen-containing tissues obtained from animal selected from mammals, aquatic animals and avian animals;
- (c) allowing the microorganisms to ferment the collagen-containing tissues for a time sufficient to permit the production of a collagen composition weighing at least about 10% of the weight of the collagen-containing tissues, wherein the collagen composition comprises mostly collagen monomers which in an SDS-PAGE comprises predominantly  $\alpha$  forms with a molecular weight of about 100 kDa;
- (d) solubilizing the fermented tissues by the addition of an acidic solution and an enzyme preparation;
- (e) precipitating the mostly collagen monomers: and
- (f) obtaining the precipitated mostly collagen monomers.

55. (Previously Presented) The method of claim 54, wherein the enzyme preparation comprises pepsin.

56. (Previously Presented) The method claim 54, wherein the precipitation is carried out by the addition of salt.

57. (Previously Presented) The method of claim 54, wherein the microorganisms

are grown for more than 24, 48 or 72 hours before fermenting the collagen-containing tissues.

58. (Previously Presented) The method of claim 54, wherein fermentation is performed with agitation and aeration.

59. (Previously Presented) The method of claim 54, wherein the collagen composition weighs at least about 50% or at least about 80% of the weight of the collagen-containing tissues.

60. (Cancelled)

61. (Currently Amended) The method of claim 54, wherein the microorganisms comprise ~~GRAS~~ generally regarded as safe (GRAS) microorganisms.

62. (Previously Presented) The method of claim 54, wherein the microorganisms comprise bacteria or yeast.

63. (Previously Presented) The method of claim 62, wherein the bacteria are Gram positive.

64. (Previously Presented) The method of claim 63, wherein the bacteria are of the genus *Bacillus*.

65. (Previously Presented) The method of claim 54, wherein the mammals are porcine.

66. (Previously Presented) The method of claim 54, wherein the aquatic animals are fish or shark.

67. (Previously Presented) The method of claim 54, wherein the avian animals are chickens.

68. (Previously Presented) A method of producing collagen monomers comprising:
- (a) providing Gram (+) bacteria belonging to the genus *Bacillus* in a Fermenter;
  - (b) providing collagen-containing tissues from one or more of mammalian, aquatic, or avian animal sources;
  - (c) allowing the bacteria to ferment the collagen-containing tissues at about 10% w/v to about 40% w/v in the fermenter for a time sufficient to permit the production of a collagen composition weighing about 20% to about 40% of the weight of the collagen-containing tissues, wherein the collagen composition comprises mostly collagen monomers which in an SDS-PAGE comprises predominantly  $\alpha$  forms with a molecular weight of about 100 kDa;
  - (d) solubilizing the fermented tissues at about 1% w/v to about 50% w/v in an acidic solution of about 0.5M acetic acid (pH 3.0) with pepsin provided at about 0.2% w/v to about 5% w/v at low temperatures;
  - (e) adding salt to the acidic solution sufficient to precipitate collagen and keeping it undisturbed overnight; and
  - (f) obtaining the precipitated mostly collagen monomers.

69. (Previously Presented) The method of 68, wherein the collagen-containing tissues are fermented in the fermenter for about 18 hours to about 48 hours.

70. (Previously Presented) The method of claim 69, wherein the collagen-containing tissues are fermented at about 10% w/v in the fermenter for about 24 hours.

71. (Previously Presented) The method of claim 69, wherein the acidic solution is

about 3% w/v of about 0.5M acetic acid (pH3.0) with pepsin provided at about 0.4% w/v to about 2% w/v and further comprising stirring for not more than about 48 hours when solubilizing the fermented tissues in the acidic solution.

72. (Previously Presented) The method of claim 71, wherein the mammalian source is porcine.

73. (Previously Presented) The method of claim 70, wherein the acidic solution is about 3% w/v of about 0.5M acetic acid (pH3.0) with pepsin provided at about 1% w/v and further comprising stirring for about 48 hours when solubilizing the fermented tissues in the acidic solution.

74. (Previously Presented) The method of claim 73, wherein the avian source is chicken.

75. (Previously Presented) The method of claim 54 or 68, wherein (a) and (b) are conducted simultaneously or sequentially, in either order.

76. (Previously Presented) The method of claim 68, wherein the low temperatures is at about 4°C.